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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,935	01/26/2004	Michael R. St. John	7773	9633

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EXAMINER	
CORDRAY, DENNIS R	
ART UNIT	**PAPER NUMBER**
1791	
MAIL DATE	**DELIVERY MODE**
10/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/764,935	ST. JOHN ET AL.	
	Examiner	Art Unit	
	Dennis Cordray	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13,15-18 and 20-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,15-18 and 20-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's amendments filed 8/8/2007 have been failed to overcome the outstanding rejections.

Applicant argues that Coscia et al in no way teaches or suggests the features of the amended claims and provides no motivation to use a ratio of aldehyde functional acrylamide to acrylamide beyond 0.20. Coscia emphasizes that the ratio should be at least 0.06 several times to produce practically useful wet strength (col 6, lines 59-66; col 13, lines 1-7; Claim 1). No such emphasis is placed on the preferred upper limit of 0.20. Coscia further teaches that the ratio may be higher (larger amounts of glyoxal reacted may be employed) although the increase in wet strength is minor. Coscia teaches that a ratio in the range of 0.10 to 0.20 appears to afford the best wet strength efficiency (the Examiner construes this as the preferred range). Coscia teaches that the optimum amount is readily found by laboratory trial using a starting point of one mole of glyoxal per every four vinylamine units present, resulting in a ratio of aldehyde functional acrylamide to acrylamide of around 0.12 to 0.13. Ratios greater than 0.2 are permitted although the gain in wet strength is minor.

A reference is not limited to its preferred embodiment, but must be evaluated for all of its teachings, including its teachings of non-preferred embodiments. In re Burckel, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979).

The previous rejection is modified and, in addition, a new rejection is made as necessitated by the amendments.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 6, 9, 13, 15-18 and 20-23 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Bjorquist et al (4603176) as evidenced by Auhorn et al (6083348) or Sanchez (6315866).

Bjorquist et al discloses temporary wet strength resins with molecular weights from 5,000 to 200,000 having improved wet tensile decay (Abs). The resins have comprise copolymers of 3-65 mol-% acrylamide, 1-30 mol-% glyoxylated acrylamide, 1-10 mol-% cationic monomer and 5-95 mol-% of a polar non-nucleophilic monomer that does not cause the polymer to become water insoluble (col 3, lines 11-33). The polymers are aldehyde functionalized by reacting with glyoxal (col 6, lines 35-56). Preferred cationic monomers include diallyldimethylammonium chloride (col 5, lines 46-48). Using the disclosed mole percent ranges, the ratio of glyoxylated acrylamide to acrylamide ranges from 0.016:1 to 10:1. In the Examples provided, the ratio ranges

from 0.03 to 2.4 (col 13, line 63 to col 15, line 11). The resins are added to paper in the amount from about 0.005% to about 2% by weight of the fiber, or from about 0.1 to about 40 lb/ton (col 9, line 66 to col 10, line 1).

Bjorquist et al does not disclose that the polymers enhance press section dewatering. It is known in the art to use polymeric additives in papermaking for multiple simultaneous purposes, such as fixing agents, drainage and retention aids, flocculants and wet or dry strength aids (Auhorn et al, 6083348, col 2, lines 34-37), thus the claimed polymers can serve more than one purpose in the process. Sanchez teaches that polyacrylamides (100% nonionic), copolymers of polyacrylamide and α,β-unsaturated quaternary ammonium compounds (i.e.-DADMAC) and glyoxylated polyacrylamide-DADMAC copolymers increase dry strength of paper products (col 1, lines 49-51 and 61-63; col 8, lines 32-58). Sanchez discloses acrylamide-DADMAC copolymers as dry strength agents and teaches that the copolymers provide several other advantages in papermaking processes, such as improved drainage and retention (dewatering aid), improved sheet formation and increased brightness (Abstract; col 2, line 63 to col 3, line 4 and lines 29-30).

Bjorquist et al adds the claimed polymer to a paper sheet in the claimed amount. In addition to providing temporary wet strength, the copolymers disclosed by Bjorquist et al will also function to enhance press section dewatering because, where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In

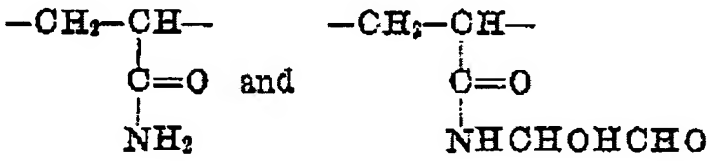
other words, when the structure recited in the reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.

Claims 1-10, 13, 15-18 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coscia et al (3556932) as evidenced by Auhorn et al or Sanchez.

Coscia et al discloses adding an aldehyde-functionalized vinylamide polymers either to preformed paper or to the fibrous suspension in a papermaking process (Abstract; col 7, lines 23-31). The polymers contain at least 50 mole percent, preferably greater than 75 mole percent, and up to 99 mole percent vinylamide (nonionic) units, which are exemplified by acrylamide (col 3, lines 42-60; col 8, Example 1, lines 9-10 and 73-75). The remainder of the monomer units in the polymer can be ionic monomers or nonionic "spacers" (such as vinyl acetate) (col 3, lines 46-49 and 58-60). Ionic monomers include cationic, such as diallyldimethyl ammonium chloride (DADMAC, also exemplified in col 3, lines 42-60; col 8, Example 1, lines 9-10 and 73-75), and anionic, such as acrylic acid (col 5, lines 69-72; col 10, Example 6, lines 45-46). The vinylamide units are partially glyoxylated such that a ratio of glyoxylated to non-glyoxylated units of at least 0.06:1 is obtained. The ratio may be higher and a preferred range of 0.06:1 to 0.2:1 (about 6-20% glyoxylated) gives the best results (col 6, lines 54-67). Coscia teaches that the optimum amount is readily found by laboratory trial using a starting point of one mole of glyoxal per every four vinylamine units present (a ratio of aldehyde functional acrylamide to acrylamide of around 0.12:1 to 0.13:1). While the lower limit of 0.06:1 is strongly emphasized (col 6, lines 59-66; col 13, lines 1-7; Claim

1), no such emphasis is placed on the upper limit of 0.20:1. Coscia teaches that higher ratios than 0.06:1 can be used but the increase in wet strength is minimal (col 6, lines 53-58). The Examiner believes that Coscia discloses any ratio above 0.06:1 and that the disclosed upper limit of 0.20:1 is a preferred limit rather than an absolute limit.

The molecular weight can be from 100,000 to 1,000,000 (col 3, lines 64-66). The polymeric composition significantly overlaps the claimed compositions. Coscia et al teaches that, in their simplest form, the polymers of the invention comprise the units



which are acrylamide, monoreacted glyoxylated acrylamide, and units that supply ionic charge to the molecule (col 4, lines 48-56).

To make the monoreacted glyoxylated acrylamide, glyoxal is reacted with the acrylamide containing polymer by warming a dilute neutral or slightly alkaline aqueous solution of glyoxal and polymer until a slight increase in viscosity is observed (col 6, lines 29-33). Example 1 provides further detail, reciting a pH of 7.5 to 8 and a temperature of 30 °C (col 8, lines 40-54). The reaction conditions are within the range given in the instant Disclosure for the reaction (see p 10, lines 4-11), thus the product will be or, at least, it would have been obvious to one of ordinary skill in the art to obtain a monoreacted glyoxylated acrylamide polymer.

Coscia discloses that the glyoxylated acrylamide polymer is added to the papermaking fibrous suspension or to the preformed paper in an amount from 0.2 to 2%

of the dry weight of the fibers, or from 4 to 40 lb/ton (col 7, lines 24-31 and 38-44) although smaller amounts also impart significant amount of wet strength. Although not explicitly disclosed, spraying is a well known method of applying an aqueous solution to a paper and would have been obvious to one of ordinary skill in the art as a functionally equivalent option.

Coscia et al does not disclose that the polymers enhance press section dewatering. The evidenciary disclosure of Auhorn et al and Sanchez are used as above.

Coscia et al adds the claimed polymer to a paper sheet in the claimed amount. In addition to enhancing wet strength, the copolymers disclosed by Coscia et al will also function as dewatering aids for reasons given above.

Claims 1-10, 13, 15-18 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coscia et al in view of Bjorquist et as evidenced by Auhorn et al or Sanchez.

The disclosures of Coscia et al, Bjorquist et, Auhorn et al and Sanchez are used as above and supplemented by the following.

Coscia et al teaches that paper made using the disclosed copolymers has an advantageous property of losing part of its wet strength when soaked in water for a moderate amount of time, and loses substantially all of its wet strength when soaked in alkaline water. The paper is thus suitable for facial and other tissues for which permanent wet strength is undesirable (col 2, lines 33-43).

Bjorquist et al teaches that paper made using the products of Coscia et al could clog septic systems. Bjorquist et al discloses temporary wet strength resins with molecular weights from 5,000 to 200,000 having improved wet tensile decay over the wet strength resins of Coscia et al (Abs; col 2, lines 17-25).

Bjorquist et al teaches that the rate of wet tensile decay is enhanced by increasing the relative proportion of hemiacetal bonds (reaction of cellulose hydroxyl groups with the aldehyde functionality) to amidol bonds formed (reaction of primary amide groups groups of one resin polymer with the aldehyde functionality of a second resin polymer. The number of amidol bonds can be reduced by reducing the number of primary amide groups (col 4, lines 26-45). This reduction is accomplished in Bjorquist et al by increasing the fraction of glyoxylated acrylamide to acrylamide and replacing some of the acrylamide monomeric units with non-nucleophilic monomeric units.

The art of Coscia et al, Bjorquist et al, Auhorn et al, Sanchez and the instant invention is analogous as pertaining to paper containing glyoxylated acrylamide polymers. It would have been obvious at the time of the invention to one of ordinary skill in the art to obtain the claimed ratio of glyoxylated acrylamide to acrylamide in the wet strength resins in the process of Coscia et al in view of Bjorquist et as evidenced by Auhorn et al or Sanchez to improve the wet tensile decay of the paper made using the resins.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coscia et al in view of Carrier et al (5654198) as evidenced by Auhorn et al or Sanchez.

Coscia et al does not disclose a polymer containing zwitterionic monomers.

Carrier et al discloses that monomers used in preparing polymers useful in aqueous systems for problems associated with particulates, emulsification and flocculation (i.e.-dewatering) can be anionic, cationic and zwitterionic (col 3, lines 14-49). Carrier et al discloses copolymers comprising acrylamides and the anionic, cationic or zwitterionic monomers (col 3, lines 50-54; col 3, line 66 to col 4, line 11). Pendant aldehyde functionality is added by covalently attaching an aldehyde containing monomer to the acrylamide (col 3, line 67 to 4, line 2; col 4, lines 42-46).

The art of Coscia et al, Carrier et al and the instant invention are analogous as pertaining to the use of glyoxylated acrylamide polymers in papermaking. It would have been obvious to one skilled in the art at the time of the invention to use a glyoxylated acrylamide polymer containing zwitterionic monomers in the process of Coscia et al in view of Carrier et al as evidenced by Auhorn et al or Sanchez as a functionally equivalent option.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DRC

DRC

ERIC HUG
PRIMARY EXAMINER